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ABSTRACT

Basic skills education has become a pressing need in the construction industry as jobs become more complex and fewer workers have needed skills. However, the construction industry lags in spending on training for entry-level workers. The Home Builders Institute (HBI) is testing a pilot basic skills program that it hopes will prove useful to the industry. HBI's basic skills classes are being held at four sites, with a goal of reaching 400 employees. Called FOUNDATIONS, the new basic skills program targets current construction workers who are unable to perform their jobs satisfactorily because of inadequate basic skills. Participants, who typically are screened and found to have between fourth- and eighth-grade skill levels, spend about 8 weeks in the open-entry/open-exit program. HBI developed the curriculum for the program from actual job-site materials submitted by construction companies. Similar programs have been developed by the bricklayers and masonry unions, the Associated General Contractors of America, Jersey City State College (which offers training in construction work for women), and the Dade County Housing Renovation Partnership (which trains welfare recipients in basic skills and job skills in construction trades). (KC)

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NO. 27 APRIL 1991

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CONSTRUCTION & BASIC SKILLS

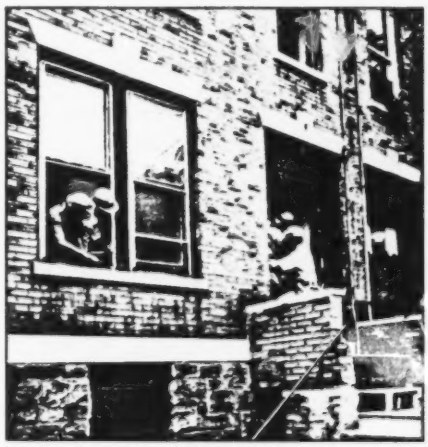

Photo Courtesy of Home Builders Institute

A master carpenter installing new sealed panel windows made of lightweight material and a pulley system different from the kind he has always used cannot read two little tabs in the corner instructing that nails be inserted in a specific spot in relation to the pulley. Because he hammers the nails in the wrong place, they go through the casing and the windows will not open or shut. These new window systems cost several hundred dollars each, so it is an expensive mistake. A young carpenter who cannot measure precisely cuts a quantity of lumber too short. When the order is delivered it cannot be used, resulting in wasted material, time, and money. A subcontractor taking an order by phone for rounded edge cedar planks does not write it up properly. The builder receives square edge planks of a lower grade wood and rejects the order. Not only does the subcontractor lose a client, but the builder must pay his crew while awaiting new supplies from another company.

A young electrician cannot understand the instructions for grounding a pneumatic drill and gets an electric shock when he operates it; another worker can't follow directions for using new cleaning agents, inhales the fumes and becomes ill. Both workers have to go on sick leave. A small business supplier cannot estimate correctly and makes a job bid that is much too low. Although he wins the contract, he loses money on the deal. Workers receiving a delivery of appliances and doorframes cannot read the carton directions saying "this side up" and "stack upright." The items are stored improperly. Eventually the appliances break and the doorframes warp. The site superintendent of a residential building must also be a sales and public relations agent, walking potential clients through the site. She cannot make a correct "punch" list of repairs or deal with irate clients and the sale is lost.

As these examples indicate, the building and construction industry, like every other, has become more complex and technical. In the past, this was a field where a strong young man without much education could always get some kind of work, but with the introduction of labor saving devices such as ditch diggers, miniature loaders and graders, concrete pump and plaster machines, prefabricated window and floor units, and other new equipment and material, the need for unskilled labor has decreased substantially. Higher basic skills are now required at every level and the old "I can figure it out" approach will not suffice.

According to a recent report by the Home Builders Institute [*An Analysis of America's Construction Industry Work Force & Occupational Projections, 1990-1996**], a number of pressures and trends have converged to make basic skills education an urgent industry need. For example, two-thirds of workers construction firms today have skills below those needed on their jobs. At the same time, with the growing demand for remodeling and building maintenance, today's workers need a broader range of skills than in the past. Moreover, construction work has relied heavily in the past on young male workers, and the pool of young people available for new hire is shrinking. To fill the gap, the industry will have to reach out more to minorities, older workers, and women. Furthermore, there is a trend in the industry toward subcontracting, with some 80 percent of all large volume builders now contracting out more than three quarters of their work.

The HBI report concludes that construction, especially residential, lags behind other industries in recognizing the need for basic skills programs. It cites a 1990 survey of construction executives by Towers Perrin and the Hudson Institute indicating that while senior managers at 65 percent of the companies express concern about impending skilled worker shortages, a full two-thirds of them spend less than $2,000 a year on training entry-level workers. Indeed, a study carried out by the American Society for Training and Development in 1984 ranked construction next to last in per-employee

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*For a copy of *An Analysis of America's Construction Industry Work Force & Occupational Projections, 1990-1996*, call the Home Builders Institute at 800-368-5242.

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CONSTRUCTION

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spending for training. Pat MacAuley of Construction Review has been observing the industry for the past decade, and he says that "most training programs focus on teaching someone to become a better bricklayer or better stonemason without recognizing that this can't happen until their literacy is upgraded." Fortunately, as this article suggests, some recent initiatives in the industry should help point the way to needed solutions.

A Complex Industry In Flux: The Context

Building and construction is a huge and diverse industry, one on which many other industries depend. It is a singularly important economic force, and one of the country's largest employers. According to Bureau of Labor Statistics data, it is made up of nearly 540,000 small and large employers. About 98 percent of these firms are small businesses. In January 1991, the industry directly employed 4.8 million persons, some 95 percent of them in small businesses. Its specific segments are represented by a vast array of specialized national associations and unions which serve one or more parts of the industry.

Construction is a difficult universe to characterize because of its occupational variety, its highly decentralized nature, and its heavy preponderance of "mom and pop" operations too small to be included in national surveys. Generally, the industry involves the maintenance, remodeling, and building of structures of all kinds: homes and apartments, factories, dams and bridges, highways and railroads, pipelines and sewer systems, hospitals, schools, and shopping malls. Among its scores of different occupations are architects and engineers, apprentices, helpers, laborers, and journeymen. There are "structural" journeymen such as carpenters, bricklayers, ironworkers, stonemasons, and riggers; "mechanical" journeymen such as electricians, plumbers, pipefitters, sheetmetal workers, and elevator constructors; and journeymen "finishers" such as painters, plasterers, tile and marble setters, roofers, and asbestos workers. There also are suppliers of a great many different products needed within the industry, such as fixtures, doorknobs, and window systems. And beyond this are a whole range of occupations that while not technically within the industry depend on it for a livelihood—real estate agents, interior decorators, landscape designers, furniture manufacturers, and real estate bank officers, for example.

As the American economy has moved into recession, it has generated a sharper decline in building and construction than in other industries. For example, while the construction workforce expanded steadily during most of the past decade (from 4.4 million in 1984 to over 5.2 million at one high point in 1990), it has suddenly dropped sharply, down to 4.8 million in January 1991, a loss of more than 450,000 jobs in just a few months. As a proportion of U.S. employment, construction employment has also dropped sudden[ly] [from] a [high] percent of all U.S. employment in 1989, [to] 4.1 percent last year, and by January of this year was down to 4.4 percent. In 1990, the average unemployment rate for construction workers was 11.1 percent, nearly double the national unemployment rate. Then, by January, industry unemployment reached 19.7 percent. Nearly one in every five workers is currently unemployed, accounting for 14 percent of total U.S. unemployment.

According to Sally Brain, an economist formerly with the Bureau of Labor Statistics and now an analyst for the Association of General Contractors and other construction unions, while unskilled workers are among those now out of work, poor basic skills are not the underlying cause for the high unemployment rate. "Lost workers," she says, "represent a whole variety of skills and occupations, right across the board. The main factor for the loss is the national recession and credit crunch, which has hit certain regions of the country, like the Northeast and Florida, especially hard." Moreover, the present decline in construction, while the result of the overall economic climate, in turn drags the economy down even further because so many other industries, like steel, lumber, and equipment manufacturing, depend on construction as their main buyers. "As the national economy picks up," observes Ms. Brain, "recovery in construction will come, too, but it will be gradual, and some states will recover more slowly than others. This means that large numbers of unemployed and displaced construction workers are not likely to be absorbed back into the industry for some time."

Even in the current circumstances, however, the powerful role of construction as a generator of income and jobs is clear. To illustrate the point, Brain stresses that in 1990 a total of $434.3 billion was spent on new construction. (Of that, $187 billion went for residential construction, $137.5 billion for nonresidential construction, and nearly $110 billion for highways, water and sewer systems, hospitals, public housing and other public construction.) Furthermore, says Brain, each dollar spent on new construction in the U.S. generates more than $3.60 in economic activity among retailers, utilities, transportation, computer services, and the like. And each $1 million spent on new construction creates nearly 47,000 jobs.

Building FOUNDATIONS At HBI

The National Association of Home Builders (NAHB), representing over 160,000 builders, subcontractors, supplier groups, and other businesses in residential and light construction, is in the midst of a pilot basic skills program that it hopes will prove useful on an industry-wide basis. NAHB operates through a network of some 800 state and local affiliate associations. Its educational arm, the Home Builders Institute (HBI), has been developing education programs and materials, sponsoring training programs and seminars, and providing job placement services for the membership for more than two decades.

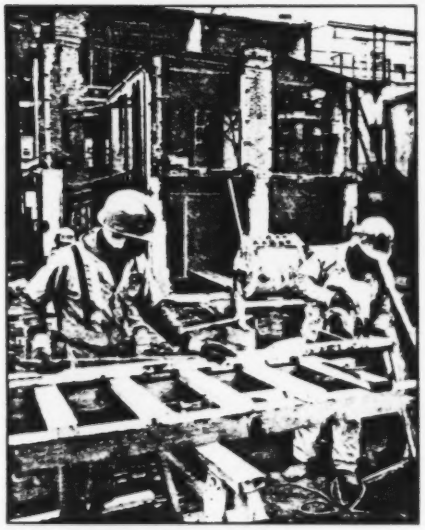

Photo Courtesy of Home Builders Institute

Under a $392,000 matching grant from the U.S. Department of Education, HBI's basic skills program is being piloted in cooperation with four state and local associations: the Oregon State Home Builders Association, the North Carolina Home Builders Association, the Home Builders Association of Louisville, Kentucky, and the Suburban Maryland Home Builders Association. A fifth partner in the effort is Partners for American Vocational Education (PAVE) of Alexandria, Virginia. The role of each association partner is to promote the program among its member companies, help those companies recruit employees to the program, review the suitability and effectiveness of curricular materials, develop incentives for employee participation, and provide classroom space. HBI is responsible for overall program design and implementation, and PAVE contributes learner and program evaluation services. As of last month, classes were in process at all four sites, and the goal is to reach a total of 400 employees, 100 at each site, by the end of November.

Called FOUNDATIONS, the new basic skills program targets current construction workers who are unable to perform their jobs satisfactorily because of inadequate basic skills. Each employee is screened for math and literacy ability and those who score between 4th and 8th grade level are eligible to participate. On average, a participant spends about 8 weeks in the program, but an open-entry, open-exit approach is used so that people needing more time have it.

The instructor, employer, and employee confer, and FOUNDATIONS can be adapted to individual areas of need. Chris Stitcher and Judith Becker of HBI,

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CONSTRUCTION

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who have the primary curriculum design role, have visited each site to get input from employers and employees so as to make the program responsive to local need. Area companies submitted actual work materials such as manuals, floor plans, safety pamphlets, and warning signs. The curriculum, which was adapted from an existing HBI Craft/Math program, includes such math tasks as reading scale drawings, doing basic math calculations, converting inches to feet, and estimating quantities for orders. The verbal/written portion covers industry terminology, filling out forms, communicating verbally in person and on the phone, and other job tasks in which reading and writing must be used.

Although the basic instructional approach is the same in all four pilots, there is variation in the way each program is targeted. Louisville, for instance, is working with public housing authority projects with a focus on building maintenance and renovation. The North Carolina site has signed up a manufacturer of building supplies and another manufacturer who produces building trusses for the East Coast. Oregon's focus is on small businesses in the Portland area, running the gamut from builders to landscapers to air conditioning and heating installers. Maryland, by contrast, has a general focus.

Henry Landau, HBI board member and president of H.S. Landau of Ann Arbor, Michigan, has been closely involved with the FOUNDATIONS project from its inception. He believes it will eventually benefit not only current workers but new entry-level employees. He is convinced that an industry commitment to skills upgrading "will lead to safer work practices, cost savings, less damage of new materials and waste, and ultimately make the industry more competitive." Noting that construction is one of the most hazardous of industries, he adds that "our goal is to motivate people to get educational help, to improve their performance on the job, to reduce injuries and absences, and to direct those who want to continue their education to services beyond this program."

HBI has applied for a second grant from the U.S. Department of Education, and hopes, after the current demonstration ends in November, to continue and expand the project to four more sites, continually refining it so that a strong and proven industry-wide model results.

(For more information contact Judith Becker, Director of Instructional Design, HBI, 15th and M Streets NW, Washington, DC 20005, 800-368-5242, ext. 494.)

BAC To Learning For The Trowel Trade

In October 1988 a different type of demonstration project got under way, again with primary funding from the U.S. Department of Education. In this case the effort focused on trowel trade union members, such as bricklayers, tile setters, terrazzo workers, and other masonry employees. The project, which was completed in March 1990, involved three partners, the International Union of Bricklayers and Allied Craftsmen (BAC), the International Masonry Institute (IMI), and the Council for Adult and Experiential Learning (CAEL). IMI, the grantee organization, operates a network of educational centers around the country through which apprenticeship and other training programs are offered to its membership. IMI thus provided the program and curriculum design staff, many of the instructors, and overall program supervision and evaluation. BAC, representing 107,000 trowel trade members in the U.S. and Canada, also contributed design and support staff, and was responsible for enlisting member participation in the program and establishing links with local contractors. CAEL designed and conducted a special program of national workshops.

The project, known as BAC To Learning, was designed primarily to test three different delivery approaches at sites in New York, Chicago, and Los Angeles. Its main goal was to find out which approach would best meet the flexible scheduling needs of workers constantly on the move. Trowel trade workers don't know where they will be assigned from one day to the next. They could be at one location today and another tomorrow—and even engaged in seasonal work where immediate income takes precedence over everything—thus making it difficult or impossible to appear for basic skills classes at a fixed location or a precise time.

The New York program took a computer-assisted approach, using a commerical software program from U.S. Basics that was modified to make it more responsive to the math design and vocabulary needs of the trade. In Chicago, the project contracted with several local literacy groups and community colleges which provided one-on-one and small-group tutoring, using their own materials. Tutoring times and places were chosen to accommodate the workers' schedules. In Los Angeles, the video-based GED program of Kentucky Educational Television was used. The computer and video programs both used instructional support staff drawn from IMI and BAC and based in IMI schools, but the video program relied mostly on independent at-home study. In all cases, instruction was directed to specific job-related tasks and students were assessed with specially-developed tools at the beginning and end to determine their learning gain.

Over the 18 months of the project, a total of 615 apprentices and journeymen took part in the program. Those evaluated, 100 participants selected randomly, showed a skills gain of two levels as well as improved job performance. Though none of the three approaches was judged to be best from an instructional point of view (determining this was not a program goal), the video program in Los Angeles was found to have the best results in terms of retention and popularity because it could be taken home and used at the convenience of each individual. Tutoring, especially where group classes were offered, was ranked second in popularity. Participants in the computer program were often uncomfortable with that mode, had to go to a fixed location to use it at specific times, and thus had a high dropout rate before meaningful learning could occur. [Note: Had the computer software been more job-specific, there is reason to believe that many of the participants might have made a greater effort to continue.]

In addition to the three urban pilot programs, the demonstration project also included a national workshop component. As noted above, CAEL developed the workshop format, and in 14 two-day sessions around the country CAEL trained some 167 local IMI and community college instructors on how to help journeymen, apprentices, and other union members identify their education goals and shape study plans to achieve those goals.

While the BAC To Learning program has itself ended, the experience paved the way for a number of new initiatives at IMI and BAC. New apprentices are now encouraged to undergo diagnostic assessment for placement in suitable remediation and other education programs. It is now required that job-linked workplace skills instruction be taught in all IMI schools throughout the U.S., and to this end new instructor training activities are under development. "Teaching Basic Literacy Skills" has been added to the annual Trowel Trades Instructor Training Program. As a direct result of BAC To Learning, a joint Educational Assistance Program has been implemented that will reimburse workers for job-related courses not offered by IMI. The CAEL-developed workshop will remain a part of the IMI/BAC repertory. The new assessment tool developed by the project has been judged exceptionally effective and it will continue to be used throughout the system for diagnosing need and prescribing solutions.

Funding is now being sought by IMI and BAC to develop and test additional basic skills models and to undertake a number of special projects for which the need has become apparent. For example, they hope to develop an ESL program, convert their new assessment tool into languages other than English, especially French and Spanish, and design some of the specific trade-related basic skills materials needed in the industry, particularly as they relate to workplace safety issues.

(For more information contact Bruce Voss, Executive Director, IMI, Apprenticeship and Training, 823 15th Street NW, Washington, DC 20005, 202-783-3908, or Lynn Cairnes, International Union of Bricklayers and Allied Craftsmen, 815 15th Street NW, Washington, DC 20005, 202-783-3788.)

On The Drawing Boards

The Construction Industry Workforce Foundation (CIWF), formed in 1989, has some 20 member associations including some of the nation's largest and some of its smallest. The membership spans a broad range of interests and occupations and includes such groups as the American Firesprinklers Association, the American Institute of Architects, the National Association of Minority Contractors, the National Association of Women in Construction, the Associated Builders and Contractors, and the Associated General Contractors of America. CIWF provides its members with instructional materials, how-to guides, and information about existing state-level resources. "We try to form regional coalitions to work together on common problems," says director Hazel Emerick.

The Associated General Contractors of America (AGC) is one of CIWF's largest members. It has 102 chapters spread across the country and represents some 32,500 union and non-union member firms including 8,000 general contractors. Another 24,500 firms are affiliated with AGC as "industry associates." The companies represented by AGC employ over 3.5 million people, and they perform more than 80 percent of all construction on commercial buildings, highways, and industrial and city utilities.

AGC offers its members a broad range of educational services and curricular programs ranging from pre-apprenticeship and vocational programs for carpenters, bricklayers, ironworkers, plumbers, and other craftworkers, to training for supervisors and management. Except for a Supervisors Training Program written at 8th-grade level, none of its programs have a basic skills component. Craig Grimm, Assistant Director of Manpower and Train-

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ing, says that "there's a need for basic skills at every level, not just entry level. It's an ongoing need from apprentice to journeyman to supervisor to foreman. When we first started developing our craftwork curriculum we assumed like everyone else that job applicants had a certain level of math, reading, and writing. In the late 80's we began to realize that we needed to provide some sort of basic skills instruction."

This summer, CIWF, AGC, and other CIWF association members will come together to try and identify just what kind of basic skills help CIWF's member companies need to provide. CIWF will use the results of this joint consultation, relying heavily on AGC because of its size, to design a basic skills strategy and program with industry-wide application.

Another large member of CIWF is the Associated Builders and Contractors (ABC). ABC serves the same construction sector as AGC except that its 18,000 member firms, represented by 77 chapters, consist primarily of open-shop or non-union businesses. While ABC will cooperate with the CIWF project on its basic skills initiative, its focus is on a major undertaking of its own. Many of ABC's chapters now test anyone signing up for a first-year apprenticeship. Dick Maresco, Vice President of Education and Safety, says that "if the individual does not have the required 12th-grade reading level, we mandate pre-apprenticeship training until they attain the skills needed. We'd rather keep our standards high and train applicants to that level, not lower the standards." Following ABC's recent annual convention in Hawaii, ABC resolved to restructure its Merit Shop Foundation, the unit through which its educational programs are offered, to incorporate job-related basic skills. "We'll be working on this in the coming months," Maresco stresses, "with an emphasis on pooling members' training resources to avoid wasteful duplication. We'll develop a core curriculum to train workers and to certify teachers and workers." Initially, the program will focus on five craftworker categories: pipefitters, electricians, instrumentation workers, welders, and millwrights. The Foundation will meet with training directors from the member companies, examine their materials and needs, and use the findings to shape a single program using a standard manual. The goal is to get ABC's craftworkers properly certified.

(For more information contact Hazel Emerick, Director, CIWF, PO Box 57131, Washington, DC 20037, 800-THE-CIWF; Craig Grimm, Assistant Director, Manpower and Training, AGC, 1957 E Street NW, Washington, DC 20006, 202-393-2040; and Dick Maresco, Vice President, Education and Safety, ABC, 729 15th Street NW, Washington, DC 20005, 202-637-8800, x 269.)

Women Make Great Home . . . Makers

"Women gain strength when they stop being economically vulnerable," says Carole Ucciferri, Director of the Vocational Opportunities for Women (VOW) project at Jersey City State College, one of some 30 programs in New Jersey being funded under the Carl D. Perkins Education Act. "About 80 percent of all working women are clustered in 20 of 441 possible occupations, with fewer than 5 percent of New Jersey women working in nontraditional jobs." Ucciferri points out that social and cultural stereotypes, lack of basic skills and access to training programs, limited support services, and job discrimination have kept women in low paying, dead end

Photos Courtesy of Vocational Opportunities for Women

jobs instead of nontraditional trade jobs which pay up to 30 percent more. "Women who still think that a knight in a polished white Camaro will come along and rescue them are sadly misguided," she says. "VOW works on a number of projects which train women to become carpenters, equipment engineers, plumbers, electricians, welders, and highway construction workers so that they can earn enough to buy Camaros for themselves."

Each project in which VOW is engaged has a slightly different focus, yet all have the same goal: to enable women to become self sufficient by securing nontraditional jobs. VOW is the leading advocate in New Jersey for such programs and the main source of technical assistance to social service agencies and other groups that work with women. Some of the projects VOW is assisting target single parents, or women who have been out of the workforce for some time. Others reach out to teen mothers, minority women, and women stuck in low paying jobs with little opportunity for advancement. To help remove the barriers the women face in entering nontraditional fields, the projects provide a whole range of services including basic skills instruction, GED preparation, ESL instruction, child care, transportation, and counseling. In addition, VOW itself maintains a statewide Equity Resource Center library, produces promotional visual and print materials, runs a recruitment and outreach assistance program, disseminates materials and information throughout the state and nation, and maintains a toll-free hotline for anyone needing advice or help. The hotline gets about 800 calls a year.

One of the most exciting projects VOW is helping, says Ucciferri, is a pre-apprenticeship training program which involves a partnership between the state's Division of Vocational Education and a Task Force of the Department of Transportation. The multi-faceted program emphasizes heavy and highway construction. It provides physical training, job site experience, technical math, and other services including transportation and child care at several sites in New Jersey. Other VOW-assisted pre-apprentice programs help women pass physical and written tests to become apprentices in ironwork, carpentry, and electrical work. VOW uses each success story from the projects in its brochures and posters to motivate and recruit other women. Gerda Peterson, the first licensed female plumber in the state, says "You name it and I can do it . . . repairs, installations, residential or commercial. Doing the job right is what counts and the men saw that I could do jobs right. Now I'm inspecting their jobs." Mary Ann Budnick, a former welfare recipient and waitress making $3 an hour, entered a pre-apprentice program and now earns $15 an hour and benefits as a railroad construction worker.

(For more information contact Carole Ucciferri, Director, Project VOW, Center for Occupational Education, Jersey City State College, 2039 Kennedy Boulevard, Jersey City, NJ 07305-1597, 201-547-2188. For those within New Jersey VOW's toll free hotline number is 800-727-7837).

Miami's Housing Renovation Partnership

Through the Dade County Housing Renovation Partnership, welfare recipients are learning basic skills and job skills at the same time in a project to renovate public housing. The partnership involves the Dade County Public School System, the Dade County Department of Housing and Urban Development, the Florida State Department of Health and Rehabilitative Services, and the Miami office of the Florida Home Builders Institute (HBI).

The Department of Health and Rehabilitative Services refers welfare clients to HBI, which provides general and job-related basic skills instruction five days a week. The skills learned are applied on the job, with the trainees transported to public housing sites where they work at the tasks of actual renovation and restoration. Although trainees are encouraged to pursue the GED, the program is open-entry, open-exit with no minimum skill requirements. "Most of the people who start out can't even read a tapemeasure," says Bill O'Donnell, project coordinator from HBI. "We get them to the point where they can paint, lay tile, do electrical work and plumbing, fix screens and locks, and do all kinds of other work. When they finish, they are at what we would call pre-apprentice level. We are using our modified Craft/Math program for the curriculum. It is so extensive that it even includes landscaping. Those who finish can go into a pre-apprentice program, then an apprentice program, and eventually they get their license in a trade." To close the loop, HBI prepares students for job interviews. Then, with the help of the other project partners, it finds them well-paying, permanent jobs.

The program is now trying to broaden its base by having contractors and other area businesses join the partnership. It has also added a new component that can lead to home ownership as well as jobs for the graduates. Under this plan, the U.S. Department of Housing and Urban Development is leasing abandoned houses to Dade County. The houses, which are restored by the students, are leased to eligible graduates and their rent placed in an escrow account. After the cost of the remodeling has been recovered, participants begin to make down payments on the houses, with local banks providing mortgages. Bertha Pitt, Principal of the Miami Skills Center of the Dade County Public Schools, points out that programs like this can be created anywhere in the country. "With partnerships like this," she says, "you can address all the needs simultaneously, so it's a winning situation for everyone involved."

(For more information contact Bill O'Donnell of the HBI or Bertha Pitt of the Miami Skills Center, 50 Northwest 14 Street, Miami, FL 33136, 305-358-4925.) ■

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